WELCOME TO MUM INDIA 2016

TARA CONSULTANTS PVT LTD

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WELCOME TO MUM INDIA 2016

About Us

We **Tara Consultants Pvt Ltd,** Offer The Best of Latest technological Product, Solutions and Services at the most competitive prices to increase productivity, quality of work conditions in automation and improve the quality of life by offering meaningful, effective and efficient solutions, Gadgets. Gizmos and Life changing Products and pursue with other core activities such as Networking Products, Audio-Visual Product, Imports, Project Consultancy. Timely delivery and High Quality Service are the integral part of TCPL philosophy for ensuring client satisfaction retention and continuation.

Agenda

How to protect ISP network from various Attacks

- **Who is ISP**
- **ISP Layer**
- **ISP Identified by**
- **What are Network attacks**
- **DDoS-DoS**
- **Port Scanner**
- **Syn Flooding**
- **Brute Force Attack**
- **Smurf Attack**
- **Blocking Regular Ports**
- **How to protect with RouterOS**
- **Live Simulation**

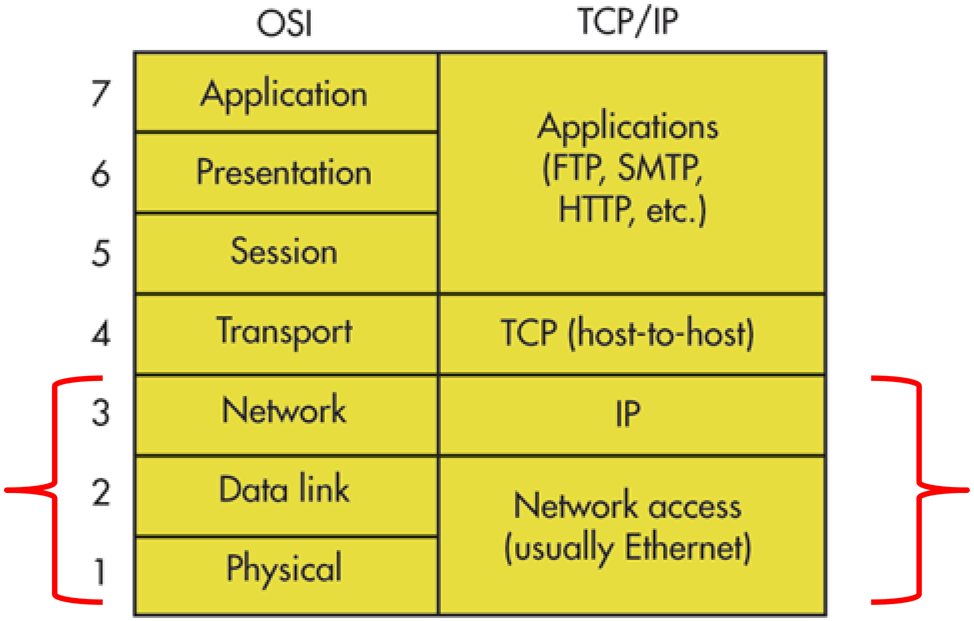
Powered by MikroTik

By Vikas Kumar Gupta

Who is ISP ?

Internet Service Provider, who provides access to Internet over Public or Private IP.

ISP Layer



	OSI	TCP/IP
7	Application	Applications (FTP, SMTP, HTTP, etc.)
6	Presentation	
5	Session	
4	Transport	TCP (host-to-host)
3	Network	IP
2	Data link	Network access (usually Ethernet)
1	Physical	

- ISP Identified by

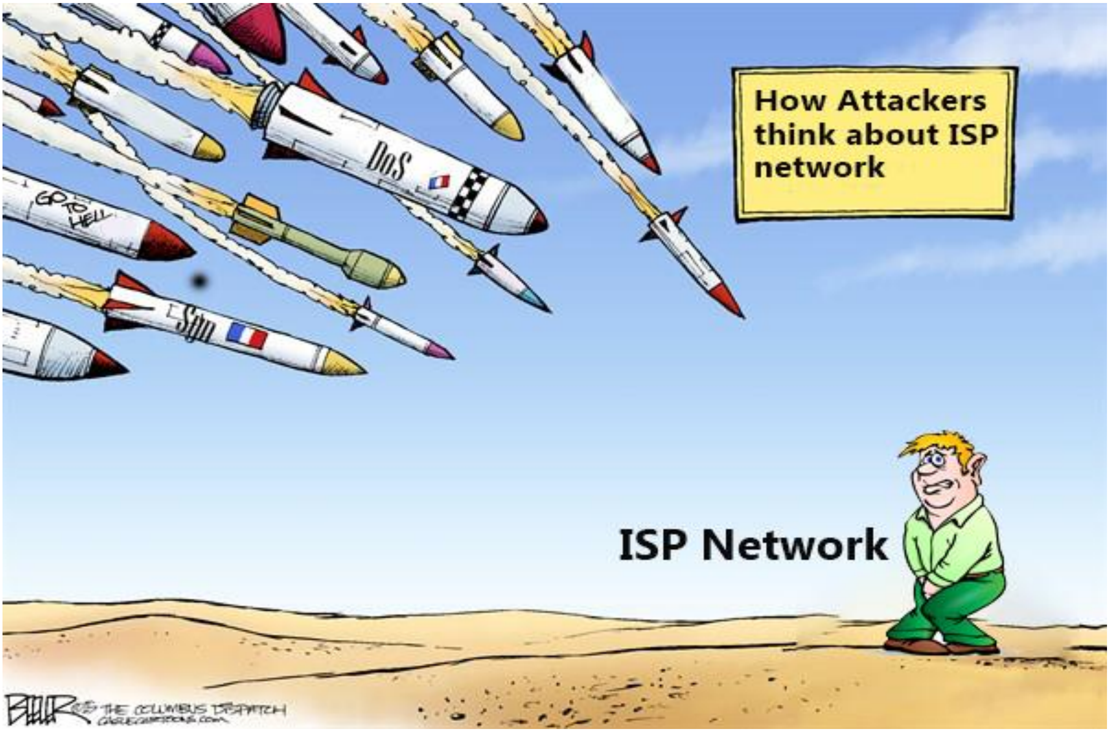
IP Address Lookup

- **What are Network attacks**

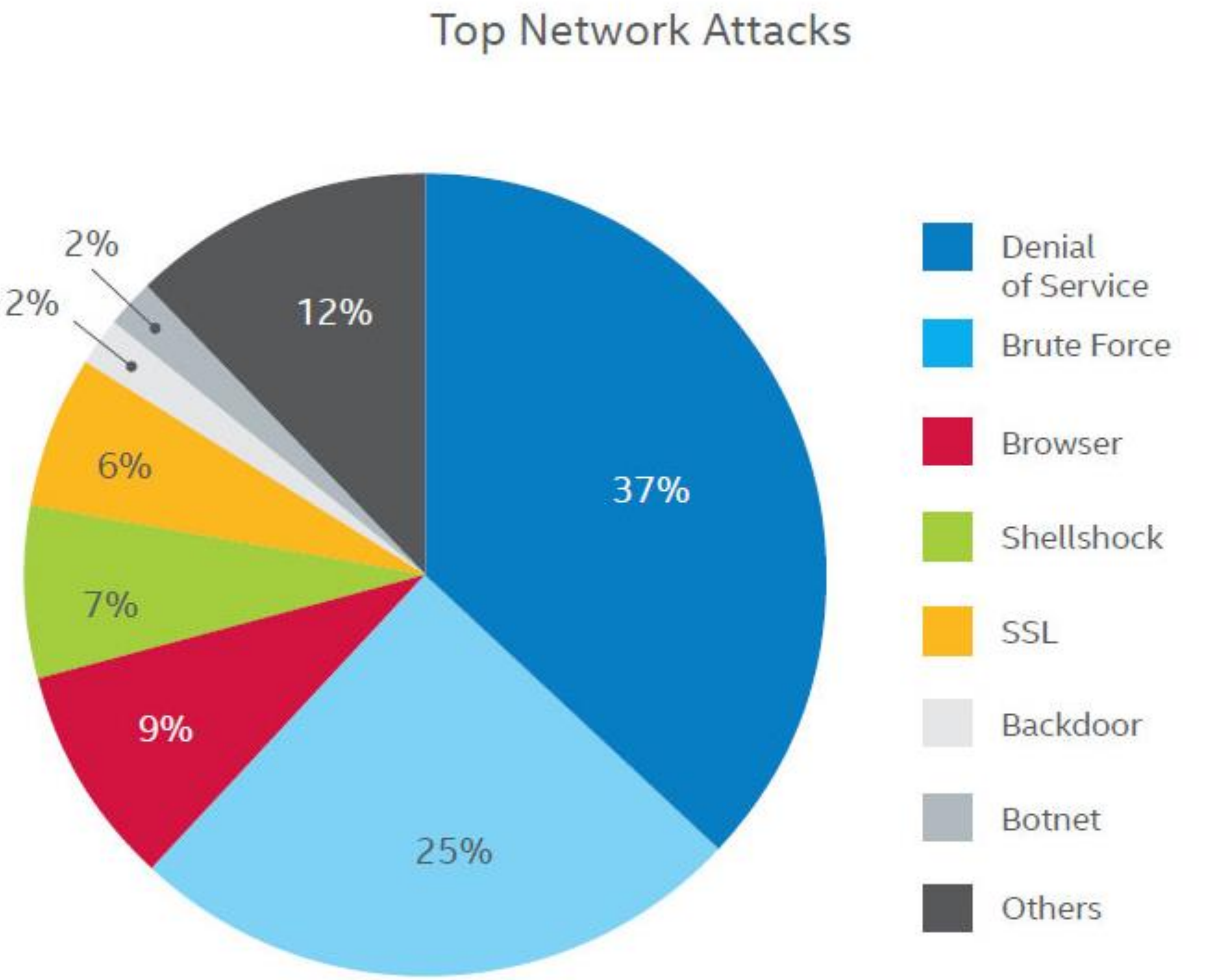
Network **attack** is any attempt to destroy, expose, alter, disable, steal or gain unauthorized access to or make unauthorized use of an asset.

Passive Attacks : Wiretapping, Port Scanning
Active Attacks. Denial-of-service attack, SYN Flooding
Brute Force Attack
Smurf Attack

As per Survey, 10-30% of
Internet Bandwidth get wasted
Due to network attacks.


DoS
GO TO HELL
Syn
How Attackers think about ISP network
ISP Network
BEELER THE COLUMBUS DISPATCH

•**Case Study on Top Network Attacks**



Source: McAfee Labs, 2015.

- **DDoS-Distributed Denial of Service**
- A **distributed denial-of-service** (**DDoS**) attack occurs when multiple systems flood the bandwidth or resources of a targeted system, usually one or more web servers/Router.

- **DoS-Denial of Service**

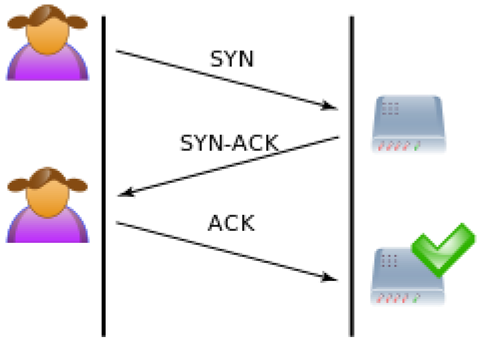
Denial-of-service (DoS) attack is an attempt to make a machine or network resource unavailable to its intended users, such as to temporarily or indefinitely interrupt or suspend services of a host connected to the Internet.

- **Port Scanner**

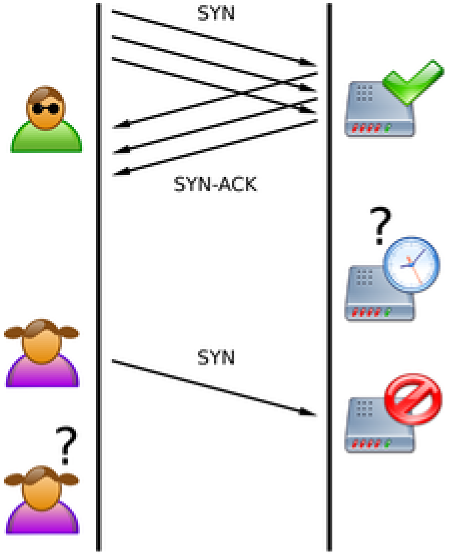
Port scanning is a method of getting list of opened and listening ports, which gives idea to hackers or attackers about vulnerability of network

- **Syn Flooding**

A **SYN flood** is a form of denial-of-service attack in which an attacker sends a succession of **SYN** requests to a target's system in an attempt to consume enough server resources to make the system unresponsive to legitimate traffic.



A normal connection between a user and a server. The three-way handshake is correctly performed



SYN Flood. The attacker sends several packets but does not send the "ACK" back to the server. The connections are hence half-opened and consuming server resources. Neeraj, a legitimate user, tries to connect but the server refuses to open a connection resulting in a denial of service.

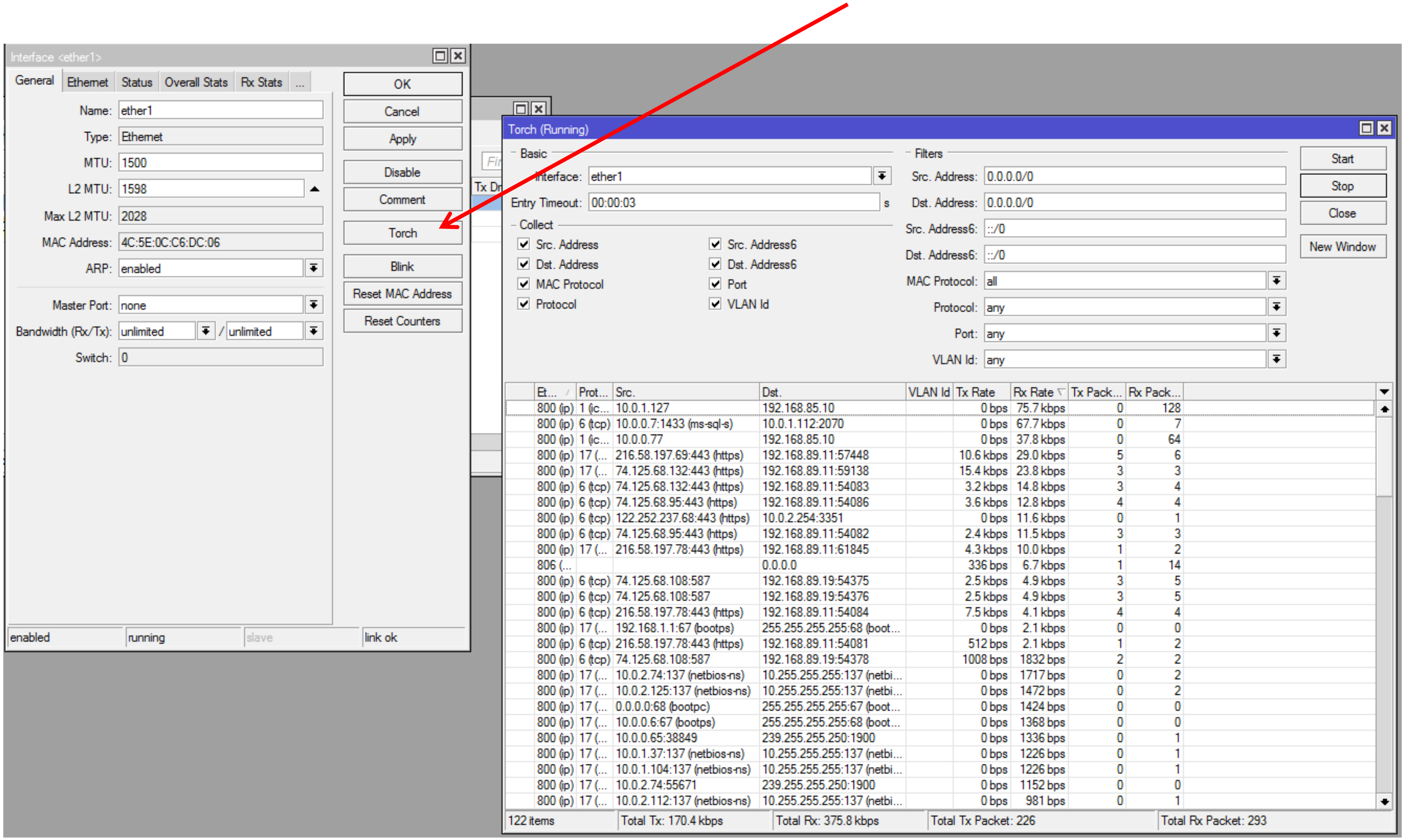
- **Brute Force Attack**

B**rute-force attack** consists of an attacker trying many passwords or passphrases with the hope of eventually guessing correctly. The attacker systematically checks all possible passwords and passphrases until the correct one is found. Alternatively, the attacker can attempt to guess the key.

- **Smurf Attack**

The **Smurf Attack** is a distributed denial-of-service **attack** in which large numbers of Internet Control Message Protocol (ICMP) packets with the intended victim's spoofed source IP are broadcast to a computer network using an IP Broadcast address.

Searching Flooding source with Mikrotik



Interface <ether1>

Name: ether1
Type: Ethernet
MTU: 1500
L2 MTU: 1598
Max L2 MTU: 2028
MAC Address: 4C:5E:0C:C6:DC:06
ARP: enabled
Master Port: none
Bandwidth (Rx/Tx): unlimited / unlimited
Switch: 0

enabled | running | slave | link ok

Torch (Running)

Basic
Interface: ether1
Entry Timeout: 00:00:03 s

Collect
☑ Src. Address ☑ Src. Address6
☑ Dst. Address ☑ Dst. Address6
☑ MAC Protocol ☑ Port
☑ Protocol ☑ VLAN Id

Filters
Src. Address: 0.0.0.0/0
Dst. Address: 0.0.0.0/0
Src. Address6: ::/0
Dst. Address6: ::/0
MAC Protocol: all
Protocol: any
Port: any
VLAN Id: any

Et...	Prot...	Src.	Dst.	VLAN Id	Tx Rate	Rx Rate	Tx Pack...	Rx Pack...
800 (ip)	1 (ic...	10.0.1.127	192.168.85.10		0 bps	75.7 kbps	0	128
800 (ip)	6 (tcp)	10.0.0.7:1433 (ms-sql-s)	10.0.1.112:2070		0 bps	67.7 kbps	0	7
800 (ip)	1 (ic...	10.0.0.77	192.168.85.10		0 bps	37.8 kbps	0	64
800 (ip)	17 (...	216.58.197.69:443 (https)	192.168.89.11:57448		10.6 kbps	29.0 kbps	5	6
800 (ip)	17 (...	74.125.68.132:443 (https)	192.168.89.11:59138		15.4 kbps	23.8 kbps	3	3
800 (ip)	6 (tcp)	74.125.68.132:443 (https)	192.168.89.11:54083		3.2 kbps	14.8 kbps	3	4
800 (ip)	6 (tcp)	74.125.68.95:443 (https)	192.168.89.11:54086		3.6 kbps	12.8 kbps	4	4
800 (ip)	6 (tcp)	122.252.237.68:443 (https)	10.0.2.254:3351		0 bps	11.6 kbps	0	1
800 (ip)	6 (tcp)	74.125.68.95:443 (https)	192.168.89.11:54082		2.4 kbps	11.5 kbps	3	3
800 (ip)	17 (...	216.58.197.78:443 (https)	192.168.89.11:61845		4.3 kbps	10.0 kbps	1	2
806 (...			0.0.0.0		336 bps	6.7 kbps	1	14
800 (ip)	6 (tcp)	74.125.68.108:587	192.168.89.19:54375		2.5 kbps	4.9 kbps	3	5
800 (ip)	6 (tcp)	74.125.68.108:587	192.168.89.19:54376		2.5 kbps	4.9 kbps	3	5
800 (ip)	6 (tcp)	216.58.197.78:443 (https)	192.168.89.11:54084		7.5 kbps	4.1 kbps	4	4
800 (ip)	17 (...	192.168.1.1:67 (bootps)	255.255.255.255:68 (boot...		0 bps	2.1 kbps	0	0
800 (ip)	6 (tcp)	216.58.197.78:443 (https)	192.168.89.11:54081		512 bps	2.1 kbps	1	2
800 (ip)	6 (tcp)	74.125.68.108:587	192.168.89.19:54378		1008 bps	1832 bps	2	2
800 (ip)	17 (...	10.0.2.74:137 (netbios-ns)	10.255.255.255:137 (netbi...		0 bps	1717 bps	0	2
800 (ip)	17 (...	10.0.2.125:137 (netbios-ns)	10.255.255.255:137 (netbi...		0 bps	1472 bps	0	2
800 (ip)	17 (...	0.0.0.0:68 (bootpc)	255.255.255.255:67 (boot...		0 bps	1424 bps	0	0
800 (ip)	17 (...	10.0.0.6:67 (bootps)	255.255.255.255:68 (boot...		0 bps	1368 bps	0	0
800 (ip)	17 (...	10.0.0.65:38849	239.255.255.250:1900		0 bps	1336 bps	0	1
800 (ip)	17 (...	10.0.1.37:137 (netbios-ns)	10.255.255.255:137 (netbi...		0 bps	1226 bps	0	1
800 (ip)	17 (...	10.0.1.104:137 (netbios-ns)	10.255.255.255:137 (netbi...		0 bps	1226 bps	0	1
800 (ip)	17 (...	10.0.2.74:55671	239.255.255.250:1900		0 bps	1152 bps	0	0
800 (ip)	17 (...	10.0.2.112:137 (netbios-ns)	10.255.255.255:137 (netbi...		0 bps	981 bps	0	1

122 items | Total Tx: 170.4 kbps | Total Rx: 375.8 kbps | Total Tx Packet: 226 | Total Rx Packet: 293

How to protect from Attacks with RouterOS

- **Blocking Vulnerable Ports**

Protocol	Port Number	Protocol	Port Number
Both	7(Echo, WOL)	TCP	2869(uPnP)
Both	9(Discard)	UDP	4500(IPSEC)
Both	13(Daytime)	Both	389(LDAP)
Both	17(Skun trojan)	Both	445(Virus, Mail)
Both	19(CGP)	UDP	500(IKE)
TCP	113(Authentication)	UDP	520(RIP, Backdoor)
UDP	**123(NTP)**	TCP	1002(Net Meeting)
TCP	135(RPC, Virus)	TCP	1024-1030(Virus and Others)
Both	137(Net Bios)	TCP	1433(Virus, SQL)
Both	138(Net Bios, Virus)	TCP	1444(Threats)
TCP	139(Net Bios, Virus)	**TCP**	**25(SMTP)**
UDP	1701(L2tP)	**UDP**	**53(DNS)**
TCP	1720(H323)	**Both**	**8080(Webproxy)**
TCP	1723(PPtP)	**UDP**	**80(DDOS)**

Source : https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers
http://www.speedguide.net/

Note : These ports are not meant to threats everytime, but sometimes.

- **Blocking ports with RouterOS**

```
/ip firewall filter

add action=drop chain=input dst-port=111 protocol=tcp in-interface=<LAN/WAN>
add action=drop chain=input dst-port=119 protocol=udp in-interface=<LAN/WAN>
```

```
/ip firewall raw

add action=drop chain=prerouting dst-port=111 protocol=tcp in-interface=<LAN/WAN>
add action=drop chain=prerouting dst-port=119 protocol=udp in-interface=<LAN/WAN>
```

Mikrotik Filters vs RAW(New Package)

Filters	Raw
Input/Output/Forward	Prerouting/Output
Data flow to, from	Entering, Originated
Conntrack, Higher CPU	No Conntrack, Lesser CPU
L7 Matcher	No L7 Matcher
Connection Type Definable	NA
NA	DOS attack mitigation.

- **Saving from Attack**

SSH Brute Force Attack

```
/ip firewall Filter
add action=drop chain=input comment="Drop SSH brute forcers" dst-port=22
   protocol=tcp src-address-list=ssh_blacklist
add action=add-src-to-address-list address-list=ssh_blacklist \
   address-list-timeout=1w3d chain=input connection-state=new dst-port=22 \
   protocol=tcp src-address-list=ssh_stage3
add action=add-src-to-address-list address-list=ssh_stage3 \
   address-list-timeout=1m chain=input connection-state=new dst-port=22 \
   protocol=tcp src-address-list=ssh_stage2
add action=add-src-to-address-list address-list=ssh_stage2 \
   address-list-timeout=1m chain=input connection-state=new dst-port=22 \
   protocol=tcp src-address-list=ssh_stage1
add action=add-src-to-address-list address-list=ssh_stage1 \
   address-list-timeout=1m chain=input connection-state=new dst-port=22 \
   protocol=tcp
```

Source : http://wiki.mikrotik.com/wiki/Manual:IP/Firewall/Filter

Syn Flooding/ ICMP Attack

```
/ip firewall Filter
add chain=icmp comment="Limited Ping Flood" icmp-options=0 limit=5,5 \
   protocol=icmp
add chain=icmp icmp-options=3:3 limit=5,5 protocol=icmp
add chain=icmp icmp-options=3:4 limit=5,5 protocol=icmp
add chain=icmp icmp-options=8 limit=5,5 protocol=icmp
add chain=icmp icmp-options=11 limit=5,5 protocol=icmp
add action=drop chain=icmp protocol=icmp
```

Stopping Port Scanner

```
/ip firewall Filter
add action=add-src-to-address-list address-list="port scanners" \
   address-list-timeout=2w chain=input comment="Port Scanners to list" \
   protocol=tcp psd=21,3s,3,1
add action=add-src-to-address-list address-list="port scanners" \
   address-list-timeout=2w chain=input protocol=tcp tcp-flags=\
   fin,!syn,!rst,!psh,!ack,!urg
add action=add-src-to-address-list address-list="port scanners" \
   address-list-timeout=2w chain=input protocol=tcp tcp-flags=fin,syn
add action=add-src-to-address-list address-list="port scanners" \
   address-list-timeout=2w chain=input protocol=tcp tcp-flags=syn,rst
add action=add-src-to-address-list address-list="port scanners" \
   address-list-timeout=2w chain=input protocol=tcp tcp-flags=\
   fin,psh,urg,!syn,!rst,!ack
add action=add-src-to-address-list address-list="port scanners" \
   address-list-timeout=2w chain=input protocol=tcp tcp-flags=\
   fin,syn,rst,psh,ack,urg
add action=add-src-to-address-list address-list="port scanners" \
   address-list-timeout=2w chain=input protocol=tcp tcp-flags=\
   !fin,!syn,!rst,!psh,!ack,!urg
add action=drop chain=input src-address-list="port scanners"
```

DDoS Attack

```
/ip firewall Filter
add action=add-src-to-address-list address-list=blocked-addr \
   address-list-timeout=1d chain=input connection-limit=100,32 protocol=tcp
add action=tarpit chain=input connection-limit=3,32 protocol=tcp \
   src-address-list=blocked-addr
add action=jump chain=forward connection-state=new jump-target=detect-ddos
add action=return chain=detect-ddos dst-limit=32,32,src-and-dst-addresses/10s
add action=add-dst-to-address-list address-list=ddosed address-list-timeout=\
   1d chain=detect-ddos
add action=add-src-to-address-list address-list=ddoser address-list-timeout=\
   1d10m chain=detect-ddos
add action=drop chain=forward connection-state=new dst-address-list=ddosed \
   src-address-list=ddoser
```

Block Bogon IPs

```
/ip firewall filter
add action=drop chain=forward comment="Block Bogus IP Address" src-address=\
   0.0.0.0/8
add action=drop chain=forward dst-address=0.0.0.0/8
add action=drop chain=forward src-address=127.0.0.0/8
add action=drop chain=forward dst-address=127.0.0.0/8
add action=drop chain=forward src-address=224.0.0.0/3
add action=drop chain=forward dst-address=224.0.0.0/3
```

Questions ?

GPON ONU module

Product specifications

Details

➢Product code	SFPONU
➢Data Rate	1244Mb/s downstream and 2488Mb/s upstream
➢Connector	Small form factor pluggable, simplex SC
➢Format	MSA SFP

EPON OLT

- ➢Chassis based OLT (Expandable -12 Port)
- ➢GEPON OLT slots with 1: 64 splitting ratio at most
- ➢Support 256 ONU maximally
- ➢Maximum Transmission distance:20 km
- ➢Suitable for small FTTX networking access
- ➢Full gigabit link speed forword
- ➢4 uplink SFP ports

EPON ONT (SFU)

- ➢1 G
- ➢Receiver Wavelength:- 1490nm
- ➢Receiving Sensitivity:- <-25dBim
- ➢Working Temperature:- -20~+60

ONU

- ➢Fiber Port:- 1 EPON Interface, SC single-mode
- ➢single-fiber, Downstream rate 1.25Gbps,
- ➢Upstream rate 1.25Gbps
- ➢Wavelength:- Tx 1310 nm, Rx 1490 nm
- ➢Fiber Interface:- SC/PC

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Thank You for Listening ☺

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